Euler Method with n

In[104]:=

```
x0 = 0;    (* initial x *)
y0 = 1;    (* initial y *)
xn = 1;    (* final x *)
n = 10;    (* number of steps *)

h = (xn - x0) / n;

f[x_, y_] := x + y; (* example: dy/dx = x + y *)

Print["i   xi     yi"];

xi = x0;
yi = y0;

For[i = 0, i ≤ n, i++,

 Print[i, "   ", N[xi], "   ", N[yi]];

 yi = yi + h * f[xi, yi];  (* Euler update *)
 xi = xi + h;
]
```

```
i   xi     yi
0   0.   1.
1   0.1   1.1
2   0.2   1.22
3   0.3   1.362
4   0.4   1.5282
5   0.5   1.72102
6   0.6   1.94312
7   0.7   2.19743
8   0.8   2.48718
9   0.9   2.8159
10   1.   3.18748
```

Euler Method with h

In[114]:=

```
x0 = 0;    (* initial x *)
y0 = 1;    (* initial y *)
xn = 1;    (* final x *)
h = 0.1;    (* step size *)

n = Round[(xn - x0)/h]; (* steps from h *)

f[x_, y_] := x + y; (* differential equation *)

Print["i   xi        yi"];

xi = x0;
yi = y0;

For[i = 0, i ≤ n, i++,

 Print[i, "   ", N[xi], "   ", N[yi]];

 yi = yi + h*f[xi, yi];
 xi = xi + h;
]
```

```
i   xi        yi
0   0.   1.
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```